IEEE P802.11
Wireless LANs

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| LB270 CR for Miscellaneous MAC CIDs |
| Date: 2023-1-27 |
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Abstract

This submission proposes resolutions for the following comments from comment collection on P802.11-REVme D2.0:

3748, 3749, 3750, 3751, 3754, 3755, 3756, 3757, 3758, 3760, 3761, 3762, 3764, 3765

**Revision History:**

R0: Initial version.

R1: Revision based on offline feedback.

R2: Revision based on discussion during the teleconference call. CID 3748, 3749, 3751, 3760, 3761, 3762 needs further discussion.

# CID 3748 and 3749

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| **CID****Clause****Page.Line** | **Comment** | **Proposed Change** |
| 37489.2.4.1.4579.44 | It is possible to have To DS 1 From DS 1 when a backhaul link is created, where .11 association mechanims is used. | Add "This combination can also be used by implementation specific configuraiton. |
| 37499.2.4.1.4579.37 | It is possible to have To DS 1 From DS 1 when a backhaul link is created, where .11 association mechanims is used. | Change "This is the only valid combination for Data frames transmitted by a non-GLK AP and groupaddressed Data frames transmitted by a mesh STA." to "This is the only valid combination for groupaddressed Data frames transmitted by a mesh STA." |

## Discussion:

Various backhaul implementation creates fronthaul AP and backhaul STA to exchange data frame. In that case, To DS 1 and From DS 1 will be used. Suggest to clarify that To DS 1 and From DS 1 are not limited to only mesh, S1G, or GLK.

## Proposed Resolution: CID 3748 and 3749

**REVISED**

**Instruction to TGme Editor:**

Implement the proposed text updates for CID 3748 and 3749 in 11-23/0162r2

## Proposed Text Update: CID 3748 and 3749

*Instruction to TGme Editor: Update REVme D2.0 9.2.4.1.4 as shown below (track change on).*

* **To DS and From DS subfields**

The meaning of the combinations of values for the To DS and From DS subfields in Data frames are shown in Table 9-3 (Combinations of To DS subfield and From DS subfield in Data frames(#278)).

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| * **Combinations of To DS subfield and From DS subfield in Data frames(#278)**
 |
|  **To DS subfield and From DS subfield values** | **Meaning** |
| To DS = 0From DS = 0  | A Data frame from one STA to another STA within the same IBSS or the same PBSS, a Data frame direct from one non-AP STA to another non-AP STA within the same infrastructure BSS, or a Data frame outside the context of a BSS.This is the only valid combination for Data frames transmitted: a) by an IBSS or PBSS STA, b) on the direct path of a TDLS direct link, or c) outside the context of a BSS.(#574) |
| To DS = 1 From DS = 0 | A Data frame destined for the DS or being sent by a STA associated with an AP to the Port Access Entity in that AP. |
| To DS = 0From DS = 1 | A Data frame exiting the DS or being sent by the Port Access Entity in an AP, or a group addressed mesh Data frame with the Mesh Control field present using the three-address MAC header format.Option 1: This is a valid combination for Data frames transmitted by a non-GLK AP and group addressed Data frames transmitted by a mesh STA.Option 2: This is the only valid combination for Data frames transmitted by a non-GLK AP and group addressed Data frames transmitted by a mesh STA in this standard. This combination might not be the only combination used due to an implementation specific purpose by a non-GLK AP. |
| To DS = 1 From DS = 1 | (#462)A Data frame using the four-address MAC header format. This standard defines procedures for using this combination of field values in mesh BSSs (see 10.38 (Mesh forwarding framework)), by S1G relays (see 10.54 (S1G relay operation)),or by a GLK STA (see 10.65 (Addressing of GLK Data frame transmission)).(#1625) This combination might also be used by an implementation specific configuration and purpose.This is the only valid combination for individually addressed Data frames transmitted by a mesh STA. |

(…existing texts…)

# CID 3750

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| **CID****Clause****Page.Line** | **Comment** | **Proposed Change** |
| 375026.173971.5 | We have duplicate "shall" requirement below. "A STA shall not transmit an HE PPDU to a recipient STA that carries a frame that is not an HE CompressedBeamforming/CQI frame (see 26.7.3) and that exceeds the maximum MPDU length capability indicated inthe HE 6 GHz Band Capabilities element last received from the recipient STA in the 6 GHz band." in 26.17.1 Basic HE BSS operation"A STA 6G shall not transmit in an HE PPDU a frame that is not an HE Compressed Beamforming/CQIframe (see 26.7.3) and that exceeds the maximum MPDU length capability indicated in the HE 6 GHz BandCapabilities element received from the recipient STA." in 26.17.2.1 General | Remove one of the requirement. Probably removing the one in 26.17.1 |

## Discussion:

## Proposed Resolution: CID 3750

**REVISED**

**Instruction to TGme Editor:**

Implement the proposed text updates for CID 3750 in 11-23/0162r2

## Proposed Text Update: CID 3750

*Instruction to TGme Editor: Update REVme D2.0 26.17 as shown below (track change on).*

* **HE BSS operation**
* **Basic HE BSS operation**

(…existing texts…)

(…existing texts…)

# CID 3751

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| **CID****Clause****Page.Line** | **Comment** | **Proposed Change** |
| 375111.1.42352.20 | In 11.1.4.1, sometimes we use "Probe Request frame". Sometimes we use "probe reqeust". They should mean the same thing. | Unify the style to always use "Probe Reqeust frame" rather than "probe request" |

## Discussion:

## Proposed Resolution: CID 3751

**REVISED**

**Instruction to TGme Editor:**

Implement the proposed text updates for CID 3751 in 11-23/0162r2

## Proposed Text Update: CID 3751

*Instruction to TGme Editor: Update REVme D2.0 11.1.4 as shown below (track change on).*

* **Acquiring synchronization, scanning**
* **General**

…(existing texts)…

* **Passive scanning**
* **Passive scanning for non-DMG STAs**

If the ScanType parameter indicates a passive scan, the STA shall listen to each channel scanned for no longer than a maximum duration defined by the MaxChannelTime parameter.

* **Passive scanning for DMG STAs**

Upon receipt of the MLME-SCAN.request primitive with the ScanType parameter set to Passive, a DMG STA shall passively scan for transmissions on each channel specified within the ChannelList parameter of the MLME-SCAN.request primitive. The channel traversal order during passive scanning is implementation specific.

That is, the STA shall be in the receive state scanning for a period of time in a channel no less than MinChannelTime and return information on all DMG Beacon frames received matching a particular BSSID or SSID parameters specified in the MLME-SCAN.request primitive. If no DMG beacon scan parameters are specified in the request, then the STA shall return information on all received DMG Beacon frames.

If at any time during the scan the STA detects a frame that is not a DMG Beacon frame, the STA shall continue to scan the current channel until the scanning timer expires. After scanning one channel, the STA shall initiate scanning in another channel if at least one channel within the ChannelList parameter has not yet been scanned.

When the STA has completed scanning all indicated channels, it returns the scan results via the MLME-SCAN.confirm primitive.

NOTE—Unlike a DMG STA that is actively scanning and that is not a member of PBSS (see 11.1.4.3.3 (Active scanning procedure for a DMG STA)), a DMG STA that is passively scanning does not respond to Probe Request frames (see 11.1.4.3.4 (Criteria for sending a response)).

* **Active scanning and probing procedures**
* **Introduction**

Active scanning involves the generation of Probe Request frames and the subsequent processing of received probe responses. The details of the active scanning procedures are as specified in the following subclauses.

* **Active scanning procedure for a non-DMG STA**

Upon receipt of the MLME-SCAN.request primitive with ScanType parameter indicating an active scan, a STA shall use the fol-lowing procedure.

For each channel to be scanned:

* Wait until the ProbeDelay time has expired or a PHY‑RXSTART.indication primitive has been received.
* If the STA is a FILS STA (11ax)or a 6 GHz HE STA, set the FILSProbeTimer to 0 and starts the FILSProbeTimer. While the FILSProbeTimer is less than dot11FILSProbeDelay,(11ax) the STA may skip a Probe Request frame transmission and proceed to step g) after setting the ActiveScanningTimer to 0 and starting the ActiveScanningTimer, if one of the following conditions matches:
* The STA receives a broadcast Probe Request frame that the SME considers to be suitable to discover a candidate AP for association.
* The STA receives one or more of Probe Response, Beacon, Measurement Pilot, or FILS Discovery frame that identify an AP that the SME considers a suitable candidate for association.
* The STA successfully sent a Probe Request frame by following the UORA procedure as defined in 26.5.4 (UL OFDMA-based random access (UORA))).(11ax)

NOTE—How an SME considers a Probe Request frame or AP suitable is outside the scope of this standard.

* Perform the basic access procedure as defined in 10.3.4.2 (Basic access). (11ax)While waiting for access to WM, the STA may send one or more Probe Request frames by following the UORA procedure and proceed to step g). Send a Probe Request frame to the broadcast address(#1313). The Probe Request frame is sent with the SSID and BSSID from the received MLME-SCAN.request primitive. If dot11SSIDListActivated is true and the SSID List parameter is present in the MLME-SCAN.request primitive, then one or more SSID List elements should be present in the Probe Request frame, indicating all SSIDs in the SSID List parameter if possible.
* (11ax)When dot11SSIDListActivated is true and either or both of the SSID List and Short SSID List parameters are present in the MLME-SCAN. request primitive, send zero or more Probe Request frames to the broadcast address(#1313), each with one or more SSIDs indicated in the SSID List and/or Short SSID List parameters and the BSSID from the MLME-SCAN.request primitive. A Probe Request frame that contains a Short SSID List element shall have the SSID field of the SSID element set to the SSID of a known AP or set to the one-octet value 128 if the STA does not know any SSID. These additional Probe Request frames [following step c)] should only carry SSIDs not indicated in the step c) Probe Request frame. The basic access procedure (10.3.4.2 (Basic access)) is performed prior to each Probe Request frame transmission.
* Initialize the ActiveScanningTimer to 0 and start the ActiveScanningTimer.
* If a PHY-CCA.indication (BUSY) primitive is not received before the ActiveScanningTimer reaches MinChannelTime, then proceed to step k).(#132)
* If the STA is a non-FILS STA, receive all Probe Response and Beacon frames while the ActiveScanningTimer is less than MaxChannelTime.
* If the STA is a FILS STA and while the ActiveScanningTimer is less than MaxChannelTime:
* Receive Probe Response, FILS Discovery, and Beacon frames regardless of the receiver address. Process any received FILS Discovery, Probe Response, and Beacon frames.
* If the ReportingOption parameter of the MLME-SCAN.request primitive is IMMEDIATE, and the scanning FILS STA detects a BSS whose MLME-SCAN.confirm primitive has not been issued during the ongoing scan, then an MLME-SCAN.confirm primitive with the ResultCode equal to INTERMEDIATE\_SCAN\_RESULT and one or more of BSSDescriptionSet, BSSDescriptionFromFDSet, or BSSDescriptionFromMeasurementPilotSet containing information of the detected BSS is immediately issued.
* If the ReportingOption parameter of the MLME-SCAN.request primitive is CHANNEL\_SPECIFIC, do the following:
* If the ActiveScanningTimer has not reached MaxChannelTime, wait until the ActiveScanningTimer reaches the MaxChannelTime and then proceed to item 2); otherwise, proceed directly to item 2).
* Issue an MLME-SCAN.confirm primitive, with the ResultCode equal to INTERMEDIATE\_SCAN\_RESULT and one BSSDescriptionSet, BSSDescriptionFromFDSet, or BSSDescriptionFromMeasurementPilotSet containing information of all BSSs that have been discovered from the scanned channel.
* Process all probe responses received until the timer reaches MaxChannelTime, constructing BSSDescriptions corresponding to the probe responses that match the criteria specified in the MLME-SCAN.request primitive.
* Set the NAV to 0 and scan the next channel.
* When all channels in the ChannelList have been scanned, and the ReportingOption parameter of the MLME-SCAN.request primitive is AT\_END or not present, the MLME shall issue an MLME-SCAN.confirm primitive with one or more of the BSSDescriptionSet, BSSDescriptionFromFDSet, or BSSDescriptionFromMeasurementPilotSet containing all of the information gathered during the scan.

See Figure 11-7 (Active scanning by a non-DMG STA with a Probe Request frame addressed to a specific BSSID) and Figure 11-8 (Active scanning by a non-DMG STA with a Probe Request frame addressed to wildcard BSSID).

If the MLME receives an MLME-SCAN-STOP.request primitive, the STA shall stop scanning. The STA should discard any Probe Request frame queued for transmission. If the STA is transmitting a Probe Request frame, the STA shall complete the transmission of the Probe Request frame. The STA shall not continue the active scanning process on unscanned channels listed in the ChannelList parameter of the MLME-SCAN.request primitive. If the ReportingOption parameter of the MLME-SCAN.request primitive is AT\_END or not present, then the MLME shall issue an MLME-SCAN.confirm primitive with the ResultCode set to SUCCESS and with one or more of BSSDescriptionSet, BSSDescriptionFromFDSet, or BSSDescriptionFromMeasurementPilotSet containing all of the information gathered during the scan.

A FILS STA shall indicate its MaxChannelTime in the Max Channel Time field of the FILS Request Parameters element of the Probe Request frame to prevent the responding STA from transmitting the Probe Response frame after the time indicated by the MaxChannelTime has elapsed.

The Max Channel Time field shall be set to the MaxChannelTime of the MLME-SCAN.request primitive as defined in 9.4.2.177 (FILS Request Parameters element(#2193)).



* **Active scanning procedure for a DMG STA**

Upon receipt of the MLME-SCAN.request primitive with ScanType parameter indicating an active scan, a DMG STA shall use the following procedure.

For each channel to be scanned:

* Wait until the ProbeDelay time has expired or a PHY-RXSTART.indication primitive has been received.
* Initialize a timer to 0 and start it running.
* If the DiscoveryMode parameter of the MLME-SCAN.request primitive is equal to 1, generate DMG Beacon frames as (described in 11.1.3.4 (DMG beacon generation before establishment of a BSS)) for a period no longer than MaxChannelTime.
* If a DMG Beacon frame is received before the timer reaches MaxChannelTime and beamforming training is required (see 10.42 (DMG beamforming)), perform beamforming training defined in 10.42.5 (Beamforming in A-BFT).
* Perform the basic access procedure defined in 10.3.4.2 (Basic access).
* If an SSW-Feedback frame is transmitted or received in step d), then:
* Send a Probe Request frame to the broadcast address(#1313) or
* Following the transmission of an SSW-Feedback frame, send a Probe Request frame to the MAC address of the STA addressed by the SSW-Feedback frame.
* Optionally, following the reception of an SSW-Feedback frame, send a Probe Request frame to the MAC address of the STA that transmitted the SSW-Feedback frame.
* In all Probe Request frames sent under step f) 1), the Probe Request frame is sent with the SSID and BSSID from the received MLME-SCAN.request primitive and includes the DMG Capabilities element. The basic access procedure (10.3.4.2 (Basic access)) is performed prior to the Probe Request frame transmission.
* When the SSID List parameter is present in the MLME-SCAN.request primitive, send zero or more Probe Request frames to the broadcast address(#1313). Each Probe Request frame is sent with an SSID indicated in the SSID List parameter and the BSSID from the received MLME-SCAN.request primitive and includes the DMG Capabilities element. The basic access procedure (10.3.4.2 (Basic access)) is performed prior to each Probe Request frame transmission.
* If an SSW-Feedback frame is neither transmitted nor received in step d), then:
* Optionally send a Probe Request frame to the broadcast address(#1313). The Probe Request frame is sent with the SSID and BSSID from the received MLME-SCAN.request primitive and includes the DMG Capabilities element. (11ay)An EDMG STA may transmit the Probe Request frame using a quasi-omni antenna pattern and, in this case, may send the Probe Request frame using an EDMG BRP-RX PPDU. The basic access procedure (10.3.4.2 (Basic access)) is performed prior to the Probe Request frame transmission.
* When the SSID List is present in the MLME-SCAN.request primitive, send zero or more Probe Request frames to the broadcast address(#1313). Each Probe Request frame is sent with an SSID indicated in the SSID List and the BSSID from the MLME-SCAN.request primitive and includes the DMG Capabilities element. (11ay)An EDMG STA may transmit the Probe Request frame using a quasi-omni antenna pattern and, in this case, may send the Probe Request frame using an EDMG BRP-RX PPDU. The basic access procedure (10.3.4.2 (Basic access)) is performed prior to each Probe Request frame transmission.
* Respond with a probe response to any Probe Request frame received, subject to the conditions in 11.1.4.3.4 (Criteria for sending a response).

NOTE—The requirement to respond with a probe response also applies to a non-AP non-PCP DMG STA that is not a member of a PBSS.

* Process all probe responses received until the timer reaches MaxChannelTime, constructing BSSDescriptions corresponding to the probe responses that match the criteria specified in the MLME-SCAN.request primitive.
* Set the NAV to 0 and scan the next channel.

When all channels in the ChannelList have been scanned, the MLME shall issue an MLME-SCAN.confirm primitive with the BSSDescriptionSet containing all the BSSDescriptions constructed during the scan.

See Figure 11-9 (Active scanning for DMG STAs) for DMG STAs that generate DMG Beacon frames with the Discovery Mode field set to 1, where STA A and STA B are actively scanning at the same time and STA B is not a member of a PBSS. STA A may or may not be a member of a PBSS.

* **Criteria for sending a response**

If a STA that receives a Probe Request frame is not in a multiple BSSID set, that STA shall send the Probe Response frame(s), subject to the criteria below. If a STA that receives a Probe Request frame is in a multiple BSSID set, the STA corresponding to the transmitted BSSID shall send the Probe Response frame(s), subject to the criteria below; other STAs in the multiple BSSID set shall not send a Probe Response frame.

(11ay)An EDMG STA that receives a Probe Request frame before performing transmit antenna training may use a quasi-omni antenna pattern for transmission of the Probe Response. An EDMG STA that receives a Probe Request frame transmitted using an EDMG BRP-RX PPDU may perform receive training and select a transmit sector if the STA supports antenna reciprocity or antenna pattern reciprocity as indicated by setting the DMG Antenna Reciprocity field or Antenna Pattern Reciprocity field in the DMG Capabilities element to 1 respectively, for transmission to the transmitter of the Probe Request frame based on the result of the receive training.

A STA that receives a Probe Request frame shall not respond if any of the following apply:

* The STA does not match any of the following criteria:
* The STA is an AP.
* The STA is an IBSS STA.
* The STA is a mesh STA.
* The STA is a DMG STA that is not a member of a PBSS and that is performing active scan as defined in 11.1.4.3.3 (Active scanning procedure for a DMG STA).
* The STA is a PCP.
* The Address 1 field of the Probe Request frame contains an individual address and one of the following criteria is met:
* The STA is not a member of a multiple BSSID set, and the individual address is not the MAC address of the STA.
* The STA is a member of a multiple BSSID set, and the individual address does not match the BSSID of any of the BSSs in the multiple BSSID set.
* The STA is a non-AP STA in a DMG infrastructure BSS and the Address 1 field of the Probe Request frame contains the broadcast address.
* The STA is a non-PCP STA in a PBSS and the Address 1 field of the Probe Request frame contains the broadcast address.
* The STA is in an IBSS and did not transmit a Beacon or DMG Beacon frame since the last TBTT, and the Address 1 field of the Probe Request frame contains the broadcast address.
* The STA is a mesh STA and either of the following criteria are met:
* The Probe Request frame does not contain a Mesh ID element.
* The Mesh ID element in the Probe Request frame is present but does not contain the wildcard mesh ID(#1755) and does not match the mesh ID(#1755) of the MBSS with which the STA is peered.
* The STA is not a mesh STA and none of the following criteria are met:
* The SSID in the Probe Request frame is the wildcard SSID.
* The SSID in the Probe Request frame matches the SSID of the STA’s BSS.
* The STA is an AP that is in the same (#2210)colocated AP set as a 6 GHz AP, the SSID in the Probe Request frame matches the SSID of the 6 GHz AP, and the STA reports the (#2210)colocated 6 GHz AP in Beacon and Probe Response frames (see 11.53 (Out-of-band discovery of a 6 GHz BSS(11ax))).(11ax)
* The STA is a member of a multiple BSSID set and the SSID in the Probe Request frame matches any of the SSIDs of the members of that multiple BSSID set.
* (11ax)dot11SSIDListImplemented is true, and the SSID List element is present in the Probe Request frame and includes the SSID of the STA’s BSS.
* dot11SSIDListImplemented is true, the STA is an AP that is in the same (#2210)colocated AP set as a 6 GHz AP, the SSID List element is present in the Probe Request frame and includes the SSID corresponding to the (#2210)colocated 6 GHz AP, and the AP reports the (#2210)colocated 6 GHz AP in Beacon and Probe Response frames (see 11.53 (Out-of-band discovery of a 6 GHz BSS(11ax))).(11ax)
* dot11ShortSSIDListImplemented is true, and the Short SSID List element is present in the Probe Request frame and includes the Short SSID field corresponding to the SSID of the STA’s BSS.(11ax)
* dot11ShortSSIDListImplemented is true, the STA is an AP that is in the same (#2210)colocated AP set as a 6 GHz AP, the Short SSID List element is present in the Probe Request frame and includes the Short SSID field corresponding to the SSID of the 6 GHz AP, and the AP reports this 6 GHz AP in its Beacon and Probe Response frames (see 11.53 (Out-of-band discovery of a 6 GHz BSS(11ax))).(11ax)
* The STA is not a mesh STA and the Address 3 field of the Probe Request frame does not contain a wildcard BSSID and one of the following criteria is met:
* The STA is not a member of a multiple BSSID set and the Address 3 field of the Probe Request frame does not match the BSSID of the STA’s BSS.
* The STA is a member of a multiple BSSID set and the Address 3 field of the Probe Request frame does not match the BSSID of any of the BSSs in the multiple BSSID set.
* The STA has dot11InterworkingServiceActivated equal to true and the Probe Request frame contains an Interworking element and an Extended Capabilities element whose Interworking field contains the value 1, and at least one of the following criteria is not met:
* The HESSID field of the Interworking element is absent, or is present and contains the wildcard HESSID or matches the HESSID field of the InterworkingInfo parameter of the last MLME-START.request or MLME-JOIN.request primitive.
* The Access Network Type field of the Interworking element contains the wildcard access network type or matches the access network type of the STA.
* The Probe Request frame contains a DSSS Parameter Set element in which the Current Channel field contains a value that is not the same as dot11CurrentChannel.
* (11ay)The STA is a DMG STA*,* the transmit antenna of the DMG STA is not trained to transmit to the STA from which the Probe Request frame was received, and the STA is not an EDMG STA that intends to transmit the response using a quasi-omni antenna pattern.

A FILS STA shall not respond to a Probe Request frame if any of the following criteria is met for a FILS Request Parameters element contained in the Probe Request frame:

* If the FILS Criteria field is present in the FILS Requests Parameters element and the Max Delay Limit field of the FILS Request Parameters indicates a delay shorter than the selected average access delay of the responding STA. The BSS Delay Criterion field of the FILS Criteria field of the FILS Request Parameters element indicates the selected average access delay for the comparison as defined in Table 9-327 (BSS Delay Criterion subfield). The Max Delay Limit field contains the maximum selected average access delay. If the compared Average Access Delay indicates Measurement not available, the STA shall respond and the response shall include a BSS AC Access Delay element as described in 9.4.2.43 (BSS AC Access Delay element) and Average Access Delay as described in 9.4.2.38 (BSS Average Access Delay element) or Average Access Delay as described in 9.4.2.38 (BSS Average Access Delay element) that was requested in the Probe Request frame. If the compared Average Access Delay indicates Service unable to access channel, the response shall not be transmitted.
* If the FILS Criteria field is present in the FILS Requests Parameters element and the PHY Support Criterion of the FILS Criteria field of the FILS Request Parameters element is 1 and the responding STA is not HT capable.
* If the FILS Criteria field is present in the FILS Requests Parameters element and the PHY Support Criterion of the FILS Criteria field of the FILS Request Parameters element is 2 and the responding STA is not VHT capable.
* If the FILS Criteria field is present in the FILS Requests Parameters element and the PHY Support Criterion of the FILS Criteria field of the FILS Request Parameters element is 3 and the responding STA is not HE capable.(11ax)
* If the Minimum Data Rate is present in the FILS Request Parameters element and the Minimum Data Rate field of the FILS Request Parameters element indicates a data rate higher than the one that is provided over the MAC SAP.
* If the RCPI Limit field is present in the FILS Request Parameters element and either of the following conditions is true:
* The RCPI of the Probe Request frame > –90 dBm + the RCPI Limit field of the FILS Request Parameters element.
* The RCPI Limit field of the FILS Request Parameters element contains value 255.
* If the OUI Response Criteria field is present in the FILS Request Parameters element and if any of the OUIs specified by the OUI Response Criteria field are not in the list of known OUIs configured in the AP (see Known OUIs, 6.5.11.2.2 (Semantics of the service primitive)).

If the FILS Request Parameters element is present in the Probe Request frame, the responding FILS STA should discard any Probe Response frame that has not been transmitted as a response to the Probe Request frame when the elapsed time measured from the end of the reception of the Probe Request frame by the MAC entity of the responding STA exceeds the time indicated by the Max Channel Time field of the FILS Request Parameters element of the Probe Request frame. If the FILS Request Parameter element is not present in the Probe Request frame, transmission time of the Probe Response frame to the Probe Request frame by the responding STA is only limited by the retransmission procedure in 10.23.2.12 (Retransmit procedures).

NOTE 1—It is possible for the STA to leave the channel on which it sent the Probe Request frame prior to MaxChannelTime. Should this occur the STA might not receive some of the Probe Response frames transmitted.

An individually addressed Probe Response frame, subject to the criteria above, shall be transmitted to all non-FILS STAs from which a Probe Request frame is received.

If a FILS STA has dot11FILSOmitReplicateProbeResponses equal to false, an individually addressed Probe Response frame, subject to the criteria above, shall be transmitted to all STAs from which a Probe Request frame is received.

If a FILS STA receives one or more Probe Request frame(s) and the STA has dot11FILSOmitReplicateProbeResponses equal to true, then the responding STA shall respond, subject to the criteria above, via the next Beacon frame, a broadcast Probe Response frame, or one or more individually addressed Probe Response frames.

The FILS STA shall respond with the next Beacon frame, as described in 11.1.3 (Maintaining synchronization), to Probe Request frames addressed to individual or broadcast address if all of the following conditions are met:

* The STA is queuing a Beacon frame for transmission;
* The next TBTT of the responding STA is within dot11FILSBeaconResponseWindow;
* The next TBTT is no later than any deadline of Max Channel Time indicated in the FILS Request Parameter element of the Probe Request frame(s), if present; and
* The Beacon frame contains all elements requested by the Request element.

If the next Beacon frame is not used as a response, a Probe Response frame is transmitted. The Probe Response frame shall be addressed to the broadcast or the address of the transmitter of the Probe Request frame. The Probe Response frame may be transmitted to all or some of the Probe Request frames received from FILS STAs. A first FILS STA may choose not to respond to Probe Request frames from a second FILS STA addressed to the broadcast address if the first STA receives an acknowledged probe response addressed to the second STA containing the SSID of the first STA’s BSS. A non-S1G AP shall remain in the awake state, and shall respond to Probe Request frames, subject to the criteria above.

An S1G AP that is awake shall respond to Probe Request frames, subject to the criteria above. The response to the Probe Request frames shall have the same CH\_BANDWIDTH as the preceding Probe Request frame. The S1G AP may send a PV1 Probe Response frame instead of a Probe Response frame as specified in 11.1.4.3.7 (Active scanning using PV1 Probe Response).

NOTE 2—This rule does not allow an S1G AP to respond with a probe response in 1 MHz channel width after receiving a Probe Request frame in 2 MHz channel width.

An IBSS STA that sent a Beacon or DMG Beacon frame shall remain in the awake state, and shall respond to Probe Request frames, subject to the criteria above, until a Beacon or DMG Beacon frame with the BSSID of the STA’s IBSS is received.

A mesh STA or PCP that is awake shall respond to Probe Request frames, subject to the criteria above.

NOTE 3—Results of the procedures defined in this subclause are as follows:

* Infrastructure BSS: The AP is always awake to respond to Probe Request frames.
* IBSS: At least one STA will be awake to respond to Probe Request frames. More than one STA might respond to any given Probe Request frame, particularly when more than one STA transmitted a Beacon or DMG Beacon frame following the most recent TBTT, either due to not receiving a previous Beacon or DMG Beacon frame or due to collisions between beacon transmissions.
* MBSS or PBSS: At any given time it might be the case that no STA is awake to respond to Probe Request frames.

…(existing texts)…

# CID 3754, 3755, 3756, 3757

|  |  |  |
| --- | --- | --- |
| **CID****Clause****Page.Line** | **Comment** | **Proposed Change** |
| 375410.23.2.12.11907.44 | The following paragraph looks like both AP and non-AP will use dot11EDCATableMSDULifetime. However, it is not true because AP will use dot11QAPEDCATableMSDULifetime and only non-AP STA uses dot11EDCATableMSDULifetime. This is based on the description of the two MIBs. "A QoS STA shall maintain a transmit MSDU/MMPDU timer for each MSDU passed to the MAC and for eachMMPDU. dot11EDCATableMSDULifetime specifies the maximum amount of time allowed to transmit anMSDU/MMPDU for a given AC. The transmit MSDU/MMPDU timer shall be started when the MSDU/MMPDU is passed to the MAC." | Revise the sentence to clarify that AP uses dot11QAPEDCATableMSDULifetime and non-AP STA uses dot11EDCATableMSDULifetime |
| 375510.23.2.12.11907.53 | The following paragraph looks like both AP and non-AP will use dot11EDCATableMSDULifetime. However, it is not true because AP will use dot11QAPEDCATableMSDULifetime and only non-AP STA uses dot11EDCATableMSDULifetime. This is based on the description of the two MIBs. "When A-MSDU aggregation is used, the HT STA maintains a single timer for the whole A-MSDU. The timeris restarted each time an MSDU is added to the A-MSDU. The result of this procedure is that no MSDU in theA-MSDU is discarded before a period of dot11EDCATableMSDULifetime has elapsed." | Revise the sentence to clarify that AP uses dot11QAPEDCATableMSDULifetime and non-AP STA uses dot11EDCATableMSDULifetime |
| 375610.23.2.12.11908.2 | The following paragraph looks like both AP and non-AP will use dot11EDCATableMSDULifetime. However, it is not true because AP will use dot11QAPEDCATableMSDULifetime and only non-AP STA uses dot11EDCATableMSDULifetime. This is based on the description of the two MIBs. "Retries for failed transmission attempts shall continue until one or more of the following conditions occur: ... -- The transmit MSDU/MMPDU timer for the MSDU/MMPDU or any undelivered fragments of thatMSDU/MMPDU exceeds dot11EDCATableMSDULifetime." | Revise the sentence to clarify that AP uses dot11QAPEDCATableMSDULifetime and non-AP STA uses dot11EDCATableMSDULifetime |
| 375710.23.3.2.31913.12 | The following paragraph looks like both AP and non-AP will use dot11EDCATableMSDULifetime. However, it is not true because AP will use dot11QAPEDCATableMSDULifetime and only non-AP STA uses dot11EDCATableMSDULifetime. This is based on the description of the two MIBs. "When there is a transmission failure within a polled TXOP, the short retry count (as described in 10.23.2.12(Retransmit procedures)) corresponding to the failed MSDU or MMPDU shall be incremented. An MPDUbelonging to a TC is subject to the respective retry limit as well as the dot11EDCATableMSDULifetime and isdiscarded when either of them is exceeded.." | Revise the sentence to clarify that AP uses dot11QAPEDCATableMSDULifetime and non-AP STA uses dot11EDCATableMSDULifetime |

## Discussion:

The definition of dot11EDCATableMSDULifetime and dot11QAPEDCATableMSDULifetime are shown below. Propose to revise the normative behavior to align with the MIB definition.

dot11EDCATableMSDULifetime OBJECT-TYPE
SYNTAX Unsigned32 (1..4294967295)
UNITS "TUs"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"This is a control variable at a non-AP STA.
It is written by an external management entity.
Changes take effect as soon as practical in the implementation.
This attribute specifies the maximum duration an MSDU/MMPDU, for a given
AC, would be retained by the MAC at the non-AP STA before it is discarded."
DEFVAL { 500 }
::= { dot11EDCAEntry 6 }

dot11QAPEDCATableMSDULifetime OBJECT-TYPE
SYNTAX Unsigned32 (1..4294967295)
UNITS "TUs"
MAX-ACCESS read-write
STATUS current
DESCRIPTION
"This is a control variable.
It is written by an external management entity.
Changes take effect as soon as practical in the implementation.
This attribute specifies the maximum duration an MSDU/MMPDU, for a given
AC, would be retained by the MAC at the AP before it is discarded."
DEFVAL { 500 }
::= { dot11QAPEDCAEntry 6 }

## Proposed Resolution: CID 3754, 3755, 3756, 3757

**REVISED**

**Instruction to TGme Editor:**

Implement the proposed text updates for CID 3754, 3755, 3756, 3757 in 11-23/0162r2

## Proposed Text Update: CID 3754, 3755, 3756, 3757

*Instruction to TGme Editor: Update REVme D2.0 10.23.2.12.1 as shown below (track change on).*

* **General**

…(existing texts)….

A QoS STA shall maintain a transmit MSDU/MMPDU timer for each MSDU passed to the MAC and for each MMPDU. For a non-AP STA, dot11EDCATableMSDULifetime specifies the maximum amount of time allowed to transmit an MSDU/MMPDU for a given AC. For an AP, dot11QAPEDCATableMSDULifetime specifies the maximum amount of time allowed to transmit an MSDU/MMPDU for a given AC. The transmit MSDU/MMPDU timer shall be started when the MSDU/MMPDU is passed to the MAC.

NOTE—Thhe timer is started at different times for DCF and EDCA.(#2054)

When A‑MSDU aggregation is used, the HT STA maintains a single timer for the whole A‑MSDU. The timer is restarted each time an MSDU is added to the A‑MSDU. The result of this procedure is that no MSDU in the A‑MSDU is discarded before a period of dot11EDCATableMSDULifetime for a non-AP STA or dot11QAPEDCATableMSDULifetime for an AP has elapsed.

Retries for failed transmission attempts shall continue until one or more of the following conditions occur:

* The frame retry count for the MSDU, A‑MSDU, or MMPDU is equal to dot11ShortRetryLimit.
* The drop-eligible frame retry count for the MSDU, A‑MSDU, or MMPDU is equal to dot11ShortDEIRetryLimit.
* The unsolicited frame retry count for the A‑MSDU is equal to dot11UnsolicitedRetryLimit.
* The transmit MSDU/MMPDU timer for the MSDU/MMPDU or any undelivered fragments of that MSDU/MMPDU exceeds dot11EDCATableMSDULifetime for a non-AP STA or dot11QAPEDCATableMSDULifetime for an AP.

…(existing texts)….

# CID 3758

|  |  |  |
| --- | --- | --- |
| **CID****Clause****Page.Line** | **Comment** | **Proposed Change** |
| 375826.14.3.23955.20 | It should be clarified that under multiple BSS, only transmitted BSSID AP send OPS frames. | Add a sentence that under multiple BSS, only transmitted BSSID AP send OPS frames. |

## Proposed Resolution: CID 3758

**REVISED**

**Instruction to TGme Editor:**

Implement the proposed text updates for CID 3758 in 11-23/0162r2

## Proposed Text Update: CID 3758

*Instruction to TGme Editor: Update REVme D2.0 26.14.3.2 as shown below (track change on).*

* **AP operation for opportunistic power save**

To enable aperiodic opportunistic power save, an OPS AP shall schedule for transmission an OPS frame or a FILS Discovery frame with the RA field set to the broadcast address that includes a TIM element (see 9.4.2.5 (TIM element)) and an OPS element (see 9.4.2.257 (OPS element(11ax))). The AP should transmit a FILS Discovery frame instead of an OPS frame if the target transmission time closely aligns with the transmission time of a FILS Discovery frame. The OPS Duration field in the OPS element shall be set to the duration of the OPS period that immediately follows the transmission of the OPS frame or FILS Discovery frame. The TIM element is encoded specifically as defined in 9.4.2.5 (TIM element) in order to identify which STAs are not scheduled during the OPS period. If the OPS AP sets the bit corresponding to an OPS non-AP STA in the traffic indication virtual bitmap field carried by the Partial Virtual Bitmap of the TIM element of the OPS frame or FILS Discovery frame to 0, the AP should send neither individually addressed frames to the STA nor Trigger frames with a User Info field that addresses the STA during the OPS period.

For the APs in a multiple BSSID set, only the AP corresponding to the transmitted BSSID may transmit an
OPS frame; other APs corresponding to nontransmitted BSSIDs shall not transmit an OPS frame.

…(existing texts)…

# CID 3760, 3761, 3762

|  |  |  |
| --- | --- | --- |
| **CID****Clause****Page.Line** | **Comment** | **Proposed Change** |
| 37609.4.2.24.2969.44 | The following 3 sentences are not correct for AKM 12 and 13, which can only allow GCMP-256 like cipher suite. Similar consideration for AKM 11. Also, note that there is no mandate under AKM 11/12/13 to always include group cipher suite. "In non-DMG RSNA, the cipher suite selector 00-0F-AC:4 (CCMP-128) is the default group cipher suite forData frames when the Group Data Cipher Suite field is not included in the RSNE(#1776).In non-DMG RSNA, the cipher suite selector 00-0F-AC:4 (CCMP-128) is the default pairwise cipher suitewhen the Pairwise Cipher Suite List field is not included in the RSNE(#1776).In an RSNA with management frame protection enabled, the cipher suite selector 00-0F-AC:6 (BIP-CMAC-128) is the default group cipher suite for Management frames when the Group Management Cipher Suitefield is not included in the RSNE(#1776)." | Break each sentence to 3 more sentences like the following for management frame protection. SImilar revision for group data and pairwise cipher suite. "In an RSNA with management frame protection enabled and AKM is not AKM 11, 12, and 13, the cipher suite selector 00-0F-AC:6 (BIP-CMAC-128) is the default group cipher suite for Management frames when the Group Management Cipher Suitefield is not included in the RSNE(#1776). In an RSNA with management frame protection enabled and AKM is AKM 12 or 13, the cipher suite selector 00-0F-AC:12 (BIP-GMAC-256) is the default group cipher suite for Management frames when the Group Management Cipher Suitefield is not included in the RSNE(#1776). In an RSNA with management frame protection enabled and AKM is AKM 11, the cipher suite selector 00-0F-AC:11 (BIP-GMAC-256) is the default group cipher suite for Management frames when the Group Management Cipher Suitefield is not included in the RSNE(#1776)." Another approach is to mandate group cipher suite and pairwise cipher suite to be always present. |
| 37619.4.2.24.2969.44 | For the sentence "In an RSNA with management frame protection enabled, the cipher suite selector 00-0F-AC:6 (BIP-CMAC-128) is the default group cipher suite for Management frames when the Group Management Cipher Suitefield is not included in the RSNE(#1776).", why we do not have sepearate sentence for DMG RSNA which always use GCMP related MIC? | Have separate sentence for DMG RSNA when group cipher for management frame is not present and use BIP-GMAC-128 |
| 37629.4.2.24.2969.37 | The following 2 sentences are not correct for AKM 12 and 13, which can only allow GCMP-256 like cipher suite. Also, note that there is no mandate under AKM 12/13 to always include group cipher suite. "In DMG RSNA, the cipher suite selector 00-0F-AC:8 (GCMP-128) is the default group cipher suite for Dataframes when the Group Data Cipher Suite field is not included in the RSNE(#1776).In DMG RSNA, the cipher suite selector 00-0F-AC:8 (GCMP-128) is the default pairwise cipher suite whenthe Pairwise Cipher Suite List field is not included in the RSNE(#1776)." | Break each sentence to 2 sentences: first one describes the default except AKM 12 and 13. Seocnd one describes the default for AKM 12 and 13. Another approach is to mandate group cipher suite and pairwise cipher suite to be always present. |

## Discussion:

The description behavior should align with the table description for AKM 11, 12, 13 as shown below.

|  |
| --- |
| * **AKM suite selectors**
 |
| **OUI** | **Suite type** | **Meaning** | **Authentication algorithm numbers (see 9.4.1.1 (Authentication Algorithm Number field))** | **Cipher suite selector restriction (M20)** |
| **Authentication type** | **Key management type** | **Key derivation type**  |
| 00-0F-AC | 11 | Authentication negotiated over IEEE Std 802.1X using a Suite B compliant EAP method supporting SHA-256 | RSNA key management as defined in 12.7 (Keys and key distribution)  | Defined in 12.7.1.6.2 (Key derivation function (KDF)) using SHA-256 | 0 (open) | Used only with cipher suite selector values 00-0F-AC:8 (GCMP-128) and 00-0F-AC:11 (BIP-GMAC-128) |
| 00-0F-AC | 12 | Authentication negotiated over IEEE Std 802.1X using a CNSA Suite compliant EAP method | RSNA key management as defined in 12.7 (Keys and key distribution)  | Defined in 12.7.1.6.2 (Key derivation function (KDF)) using SHA-384 | 0 (open) | Used only with cipher suite selector values 00-0F-AC:9 (GCMP-256), 00-0F-AC:10 (CCMP-256), 00-0F-AC:13 (BIP-CMAC-256), and 00-0F-AC:12 (BIP-GMAC-256) |
| 00-0F-AC | 13 | FT authentication negotiated over IEEE Std 802.1X | FT key management as defined in 12.7.1.6 (FT key hierarchy) | Defined in 12.7.1.6.2 (Key derivation function (KDF)) using SHA-384 | 2 (FT) for FT protocol reassociation as defined in 13.5 (FT protocol)0 (open) for FT Initial Mobility Domain Association over IEEE Std 802.1X or PMKSA caching | Used only with cipher suite selector values 00-0F-AC:9 (GCMP-256), 00-0F-AC:10 (CCMP-256), 00-0F-AC:13 (BIP-CMAC-256), and 00-0F-AC:12 (BIP-GMAC-256) |

## Proposed Resolution: CID 3760, 3761, 3762

**REVISED**

**Instruction to TGme Editor:**

Implement the proposed text updates for CID 3760, 3761, 3762 in 11-23/0162r2

## Proposed Text Update: CID 3760, 3761, 3762

*Instruction to TGme Editor: Update REVme D2.0 9.4.2.24.2 as shown below (track change on).*

* **Cipher suites**

…(existing texts)…

|  |
| --- |
| * **Cipher suite selectors**
 |
| **OUI** | **Suite type** | **Meaning** |
| 00-0F-AC | 0 | Use group cipher suite |
| 00-0F-AC | 1 | WEP-40 |
| 00-0F-AC | 2 | TKIP |
| 00-0F-AC | 3 | Reserved |
| 00-0F-AC | 4 | CCMP-128 |
| 00-0F-AC | 5 | WEP-104 |
| 00-0F-AC | 6 | BIP-CMAC-128 |
| 00-0F-AC | 7 | Group addressed traffic not allowed |
| 00-0F-AC | 8 | GCMP-128 |
| 00-0F-AC | 9 | GCMP-256 |
| 00-0F-AC | 10 | CCMP-256 |
| 00-0F-AC | 11 | BIP-GMAC-128 |
| 00-0F-AC | 12 | BIP-GMAC-256 |
| 00-0F-AC | 13 | BIP-CMAC-256 |
| 00-0F-AC | 14–255 | Reserved |
| Other OUI or CID | Any | Vendor-specific |

Table 9-xxx (Default group cipher suite for Data frames) shows the default group cipher suite when the Group Data Cipher Suite field is not included in the RSNE.

Table 9-xxx (Default group cipher suite for Data frames)

|  |  |  |  |
| --- | --- | --- | --- |
|  | AKM is 00-0F-AC:11 | AKM is 00-0F-AC:12, or 00-0F-AC:13 | Otherwise |
| Non-DMG RSNA | 00-0F-AC:8 (GCMP-128) | 00-0F-AC:9 (GCMP-256) | 00-0F-AC:4 (CCMP-128) |
| DMG RSNA | 00-0F-AC:8 (GCMP-128) | 00-0F-AC:9 (GCMP-256) | 00-0F-AC:8 (GCMP-128) |

Table 9-xxx (Default pairwise cipher suite) shows the default pairwise cipher suite when the Pairwise Cipher Suite List field is not included in the RSNE.

Table 9-xxx (Default pairwise cipher suite)

|  |  |  |  |
| --- | --- | --- | --- |
|  | AKM is 00-0F-AC:11 | AKM is 00-0F-AC:12, or 00-0F-AC:13 | Otherwise |
| Non-DMG RSNA | 00-0F-AC:8 (GCMP-128) | 00-0F-AC:9 (GCMP-256) | 00-0F-AC:4 (CCMP-128) |
| DMG RSNA | 00-0F-AC:8 (GCMP-128) | 00-0F-AC:9 (GCMP-256) | 00-0F-AC:8 (GCMP-128) |

Table 9-xxx (Default group cipher suite for Management frames) shows the default group cipher suite for Management frames when the Group Management Cipher Suite field is not included in the RSNE.

Table 9-xxx (Default group cipher suite for Management frames)

|  |  |  |  |
| --- | --- | --- | --- |
|  | AKM is 00-0F-AC:11 | AKM is 00-0F-AC:12, or 00-0F-AC:13 | Otherwise |
| Non-DMG RSNA | 00-0F-AC:11 (BIP-GMAC-128) | 00-0F-AC:12 (BIP-GMAC-256) | 00-0F-AC:6 (BIP-CMAC-128) |
| DMG RSNA | 00-0F-AC:11 (BIP-GMAC-128) | 00-0F-AC:12 (BIP-GMAC-256) | 00-0F-AC:11 (BIP-GMAC-128) |

…(existing texts)…

# CID 3764, 3765

|  |  |  |
| --- | --- | --- |
| **CID****Clause****Page.Line** | **Comment** | **Proposed Change** |
| 37649.6.31.11712.56 | HE action should have column for time priority like VHT action. | Add time priority column |
| 37659.6.32.11715.1 | Protected HE action should have column for time priority like VHT action. | Add time priority column |

## Discussion:

Time priority column needs to be added similar lto the VHT action frame.

**Table 9-577—VHT Action field values**

|  |  |  |
| --- | --- | --- |
| **Value**  | **Meaning**  | **Time priority** |
| 0  | VHT Compressed Beamforming  | Yes |
| 1  | Group ID Management  | No |
| 2  | Operating Mode Notification  | No |
| 3–255  | Reserved |  |

## Proposed Resolution: CID 3764, 3765

**REVISED**

**Instruction to TGme Editor:**

Implement the proposed text updates for CID 3764, 3765 in 11-23/0162r2

## Proposed Text Update: CID 3764, 3765

*Instruction to TGme Editor: Update REVme D2.0 9.6.31.1 and 9.6.32.1 as shown below (track change on).*

* **HE Action frame details(11ax)**
* **HE Action field**

An HE Action field, in the octet immediately after the Category field, differentiates the HE Action frame formats. The HE Action field values associated with each frame format within the HE category are defined in Table 9-615 (HE Action field values(11ax)).

|  |  |
| --- | --- |
| * **HE Action field values(11ax)**
 |  |
| **Value** | **Meaning** | **Time priority** |
| 0 | HE Compressed Beamforming/CQI | Yes |
| 1 | Quiet Time Period | No |
| 2 | OPS | No |
| 3–255 | Reserved |  |

* **Protected HE Action frame details(11ax)**
* **Protected HE Action field**

A Protected HE Action field, in the octet immediately after the Category field, differentiates the Protected HE Action frame formats. The Protected HE Action field values associated with each frame format within the (#2217)Protected HE category are defined in Table 9-619 (Protected HE Action field values(11ax)).

|  |
| --- |
| * **Protected HE Action field values(11ax)**
 |
| **Value** | **Meaning** |
| 0 | HE BSS Color Change Announcement |
| 1 | MU EDCA Reset |
| 2–255 | Reserved |